

# SIS 2020 FOOTBALL ANALYTICS CHALLENGE

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# ASSUMPTIONS - METRIC

- Metric used in the analysis is defensive expected points added
  - $dEPA = EPA * -1$
- Since this analysis looks at the value of defensive line positions, the EPA is adjusted to show value to the defensive team
- dEPA can then be used to show the EPA for each DL position on a per play average
- dEPA for a given play is allocated to each player on the DL
- dEPA per play figures are based on 60 plays
  - That is roughly the average number of defensive snaps per team in the data

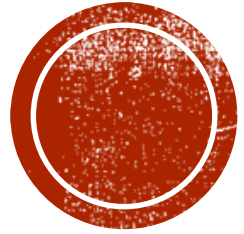


# ASSUMPTIONS — PLAYER POSITIONS

- Player positions are defined by the technique used on a given play
- Four (4) position types are analyzed:
  - Nose tackle (NT)
  - Defensive tackle (DT)
  - Defensive end (DE)
  - EDGE

Position Name	Techniques
NT	0, 1
DT	2, 2i, 3
DE	4, 4i, 5, 7
EDGE	6, 9, Outside, Off Ball

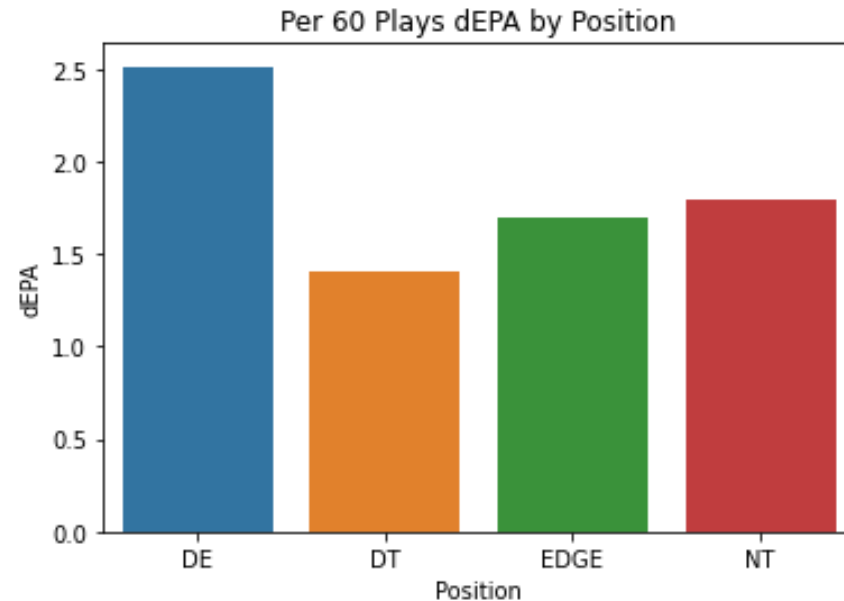




**WHICH IS THE MOST  
VALUABLE DL POSITION?**

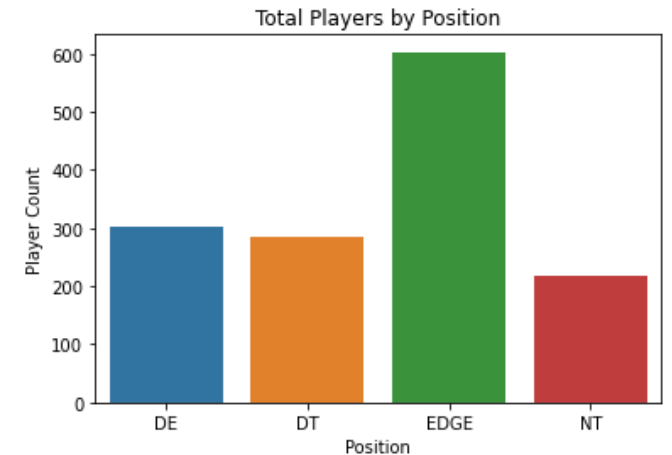
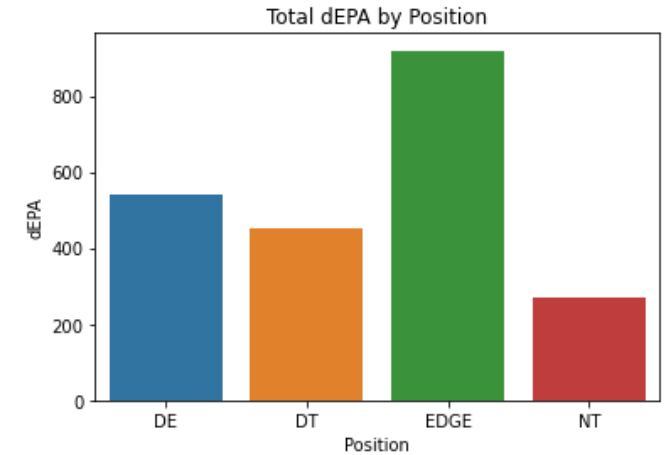
# MOST VALUABLE DL POSITION

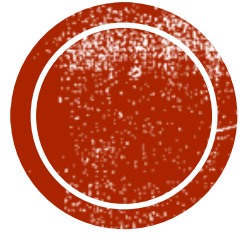
- On a per play basis DE is the most valuable position on the defensive line
- This position group produces significantly more on each play than any other position



# MOST VALUABLE DL POSITION

- However, the versatility of EDGE players make them very valuable compared to other positions
- The EDGE produced 378 more total dEPA compared to the DE position
- Any player on the defense can line up in an EDGE position, which creates confusion for the offense
  - There are nearly double the number of EDGE players in the data than any other position





# WHAT IS THE PLAY DISTRIBUTION BETWEEN POSITIONS?



# PLAY DISTRIBUTION

- EDGE rushers produce the most statistically in aggregate

Position	dEPA	Solo Sack	Assisted Sack	Pressure	Pass Breakup	Forced Fumble
DE	541	78	21	688	28	17
DT	452	92	14	701	57	8
EDGE	<b>919</b>	<b>291</b>	<b>54</b>	<b>2020</b>	<b>112</b>	<b>74</b>
NT	269	26	15	278	18	5





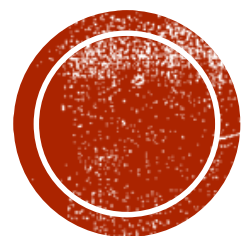
# PLAY DISTRIBUTION

- DE players produce more dEPA on a per 60 play basis than other positions
- EDGE players produce more pass rushing and “disruption” stats on a per 60 play basis

Position	dEPA	Solo Sack	Assisted Sack	Pressure	Pass Breakup	Forced Fumble
DE	<b>2.51</b>	0.36	<b>0.10</b>	3.20	0.13	<b>0.79</b>
DT	1.40	0.28	0.04	2.17	0.18	0.25
EDGE	1.69	<b>0.54</b>	<b>0.10</b>	<b>3.72</b>	<b>0.21</b>	0.14
NT	1.79	0.17	<b>0.10</b>	1.85	0.12	0.03

\*Figures based on per 60 plays





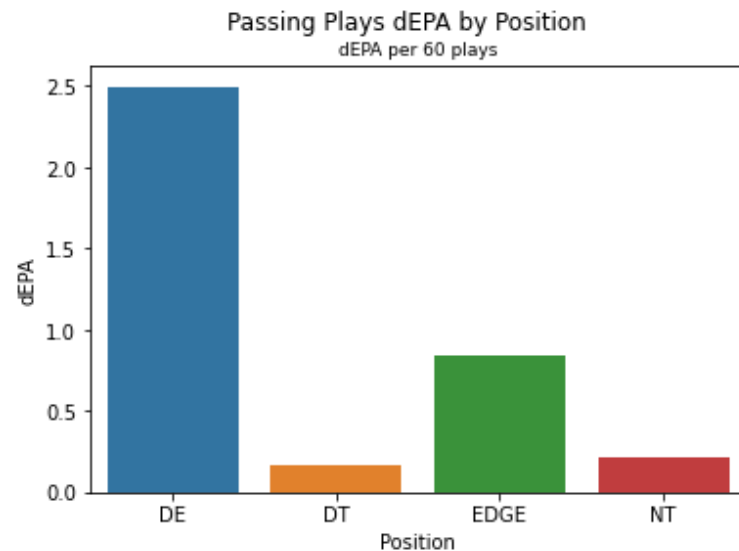
# HOW DOES VALUE CHANGE BASED ON GAME SITUATIONS?



# PASSING PLAYS

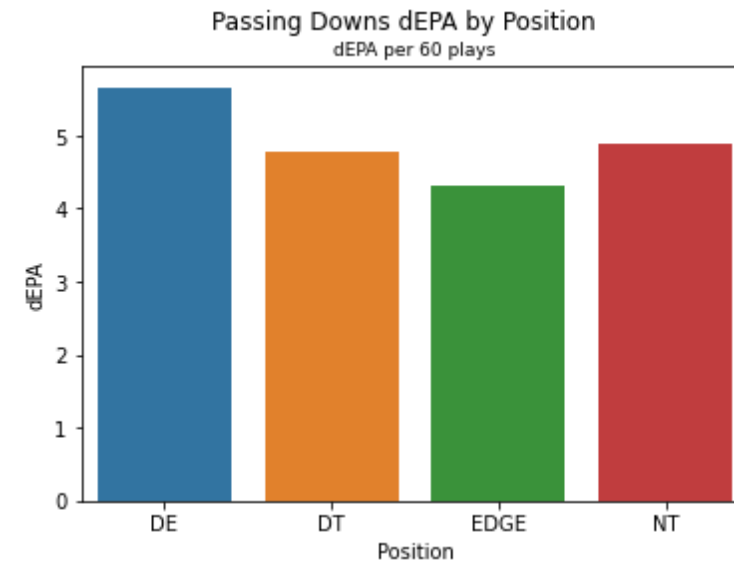
## All Passes

- DE players produce the most on all pass plays



## Likely Passing Downs

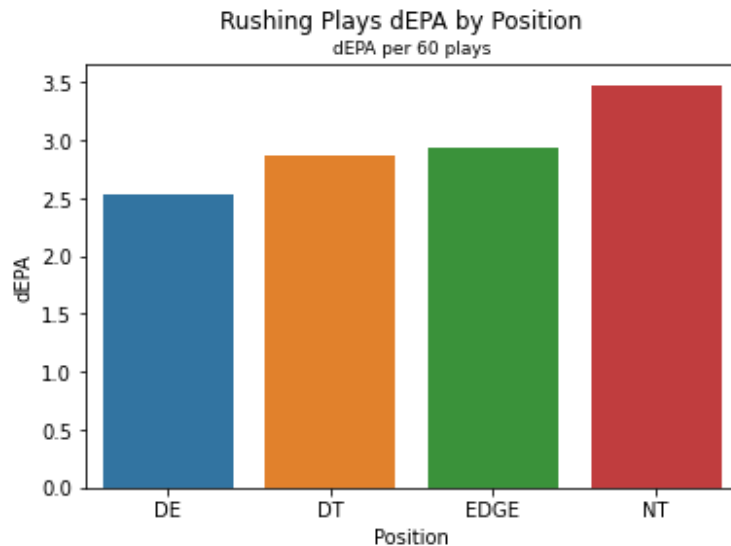
- 1<sup>st</sup> and 15 or greater
- 2<sup>nd</sup> and 10 or greater
- 3<sup>rd</sup> / 4<sup>th</sup> and 5 or greater
- Edge players produce the least



# RUSHING PLAYS

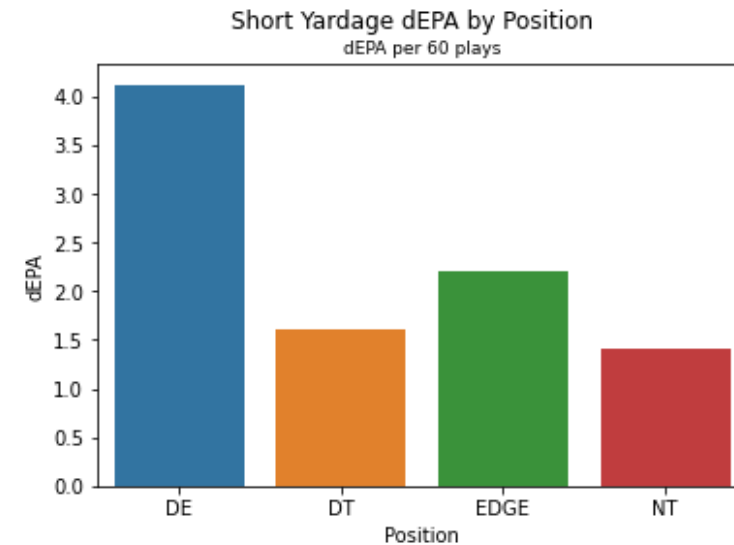
## All Rushes

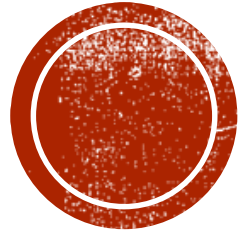
- DE players produce the least per play on all rushing plays



## Short Yardage Downs

- 3 yards or less to go
- DE produce the most on short yardage





# CONCLUSIONS AND NEXT STEPS



# CONCLUSIONS

- On a per play basis, DE is the most valuable position on the defensive line
- DEs produce at a consistently high level during all game situations
- While DEs produce better on average, their position assignments limit teams to having only 1 or 2 on the field at one time
- EDGE players are able to move all over the formation, allowing any player to have an EDGE assignment on a given play
- EDGE players produce more in aggregate due to this versatility



# NEXT STEPS

- This analysis could be expanded upon if the offensive formation information was also available
  - Defenses focus on matching up correctly to the formation the offense has on the field
  - Understanding how different DL positions and combinations produce against a spread or heavy formations would provide additional value
- Obtaining more data to analysis this metrics over a longer period of time
- Gaining a better understanding of the offensive play design
  - On run plays specifically, it would be helpful to know if the play used a zone running scheme or designed cutback
  - This could explain if the UsedDesignGap is 0, whether that was by design or if the defensive line was effective in disrupting the original play

